

## Contents, Actions and Efficacy of Weight Reduction Medications Available in the Drugs Markets, Benghazi, Libya

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### ABSTRACT

**Background:** Obesity pharmacotherapy has evolved significantly over the past 60 years. Today, six anti-obesity medications (AOMs) are approved by the Federal Drug Administration (FDA) for the long-term treatment of obesity. The aim of the present work was to investigate the types of weight management medication dispensed to patients seeking of weight reduction products in the drug markets, also know their contents, purpose and action.

**Methods:** This cross sectional study conducted in pharmacies and OPD patients with overweight and obesity. Predesigned questionnaire was validity for patients and pharmacies. The total samples collected 150 (53 males and 97 female). The data was analysis by Chi-square test and T test at  $\alpha < 0.05$ .

**Result:** The result of this study revealed that, weight managements medication used by the patients most of them not approved by FDA and contain different ingredients such as antioxidants, antidepressant, dietary fibre, anti-aging, laxative and some of the ingredient have unknown function. While other regulate blood pressure, heart function, sleeping and glucose metabolism. On the other hands the other ingredients have been found associated with appetite suppression or weight loss. The most common weight management product available in the drug markets for weight reduction were found fit slim, green tea, green coffee and orlistat, 20%, 18%, 14.7% and 8% respectively. There were some improved in health status after using the weight management products include anaemia, depression. However, there was evidence for developing of ulcer and GIT disorder after using some of weight management products. The common effect of weight management products for body weight, BMI and waist size reduction was green coffee ( $P < 0.05$ ), while the other products mostly significant effect on reduction of weight and/ or BMI or waist ( $P < 0.05$ ).

**Conclusion:** The present study revealed that, different number of products were dispensing which were not approved by FDA which contain ingredient may increasing GIT disturbance. The most weight management medication has approved it efficacy in weight reduction was green coffee. Even though, achievement of body weight reduction with some products but these still needed to be supervised and further investigation.

**Keywords:** Contents; Weight managements; Weight reduction; BMI; Action; Body weight.

### Introduction

The role of the pharmacist play a central role in the provision of pharmacotherapeutic counseling, the evaluation of treatments and the prevention of adverse effects [1]. However, via given high demands on primary and emergency services and an aging population together with the higher prevalence of chronic diseases, the pharmacist's position has had to change towards a patient-centered model. Community pharmacists are particularly well positioned to provide these "pharmaceutical services" [2] which include both the management of medicines and clinical attention. As a result, community pharmacists have developed new care models to offer a wide range of clinical services that include chronic disease management, disease prevention, transition-of-care coordination, and other pertinent disease-monitoring and management interventions [3].

Obesity has been found affected more than 1.4 billion adults worldwide with an increased its prevalence [4]. A recent scoping of research articles showed that community pharmacists have an important role in the prevention and management of overweight and obesity [5].

Obesity is recognized as a major pandemic of the 21st century, contributing to increased morbidity, mortality, and the burden of healthcare costs [5]. Overweight and obesity are defined by the World Health Organization (WHO) as a BMI of 25-29.9 kg/m<sup>2</sup> and a BMI  $\geq 30$  kg/m<sup>2</sup>, respectively [6]. In the United States, the prevalence of obesity had

risen to 42.4% in 2017-2018 [7] and predictive models now suggest that the prevalence will grow to one in two adults by 2030 [8]. Internationally, one in five adults now have obesity [9]. The Global Burden of Disease study reports that overweight and obesity are the fourth leading risk for global deaths, and more than 4.7 million adults die each year as a result of overweight or obesity [10]. Obesity is a major risk factor in the development of cardiovascular disease (CVD), type 2 diabetes (T2D), musculoskeletal disorders, and several cancers [11]. In certain ethnic populations (i.e., East Asian or South Asian), these comorbidities can develop at lower BMIs [12].

The associations between obesity, central obesity (increased waist circumference, especially intra-abdominal/visceral fat) and the risks for cardiometabolic diseases as well as obstructive sleep apnea, asthma and nonalcoholic fatty liver disease (NAFLD) are well established [13]. Cytokines secreted from visceral adipocytes, including interleukin-6, tumor necrosis factor alpha, resistin, and plasminogen activation inhibitor-1, have been implicated in the pathogenesis of these diseases, in part by promoting local and systemic states of inflammation and thrombosis [14]. A reduction in body weight of 5-10% significantly lowers inflammatory and pro-thrombotic makers, as well as chronic disease incidence [15].

Community pharmacist services in weight management have until now focused only on weight loss and/or cardiovascular risk improvement but they did not take patients' concomitant health problems and medication management into consideration. Although several interventions to reduce overweight have been implemented in the community pharmacies, there are no formal evaluations of their effects on patients' health. However, several interventions in weight management have been evaluated in the primary care setting include use of medication and herbs [16]. Increase overweight and obesity and also the people seeking weight managements products worldwide led to use medication for weight reduction with help from pharmacist in the pharmacy. However, the weight management products followed by patients were based on the advertisement and whether these products safe or not or these products approved by FDA and what contents of these products. Therefore, this study will put the light on of weight reduction products that found and distributed from the pharmacies in order to know the efficacy, action, purpose of their contents. Therefore the aim of the present work was to investigate the types ,contents and efficient of weight management medication present in the drugs market and dispensed to patients seeking of weight reduction products.

## Material and Methods

In this cross-sectional study, a total of 150 adult participants between 17 and 61 years of age obese or overweight were involved in the study. The data collected were from Jun 2021 to October 2021 on number of pharmacies and also on OPD patient's male 53 and female 97 from different polyclinic in Benghazi, Libya. The patients in this study used the weight reducing products for at least 3 months.

## Data Collection

This study consist of two parts: The first part was done by collecting information from patients and pharmacists regarding types of weight management medications used patients or available in the pharmacies. The second part of the data collected from the literature review from Google scholar and PubMed to find the action and purpose of the ingredients added to the weight management medications.

### Questionnaire Designed

The predesigned questionnaire was used contain information regarding personal information, socio-demographic data, medical history, types of weight reduction medication and in the section tow of the questionnaire there were a number of questions intending for pharmacists in the drug stores and pharmacies include types of medication for weight management available.

### Anthropometric Measurements

The participants were required to be filling out the questionnaires for all information and body weight were measured by using scale at nearest 01.kg with minimal cloths, height were measured by Tape to the nearest 0.2 cm, waist, and hip circumferences were measured as indicated by WHO [17] and as described in [18]. BMI and WHR was calculated and categorized as described [18]. Waist circumferences cut off points as following: Men > 40 inches (102 centimeters) Women > 35 inches (89 centimeters) The WHO states that abdominal obesity is defined as a waist-hip ratio above 0.90 for males and above 0.85 for females, or a body mass index (BMI) above 30.0. All participants underwent laboratory investigations which included vitamin D, serum ferritin level, folate, serum zinc, and serum copper and etc. The study was approved by the Institutional Ethics Committee. A signed informed consent was obtained from all the participants in the study.

### Statistical Analysis

The data were analyzed using SPSS (version 23). Continuous variables are summarized using number (frequency), mean, and standard deviation while categorical variables are summarized using frequency and percentage. Means were compared across groups using t-test, and proportions were compared with Karl Pearson's Chi-square test. Level of significance ( $\alpha$ ) was set at 0.05.

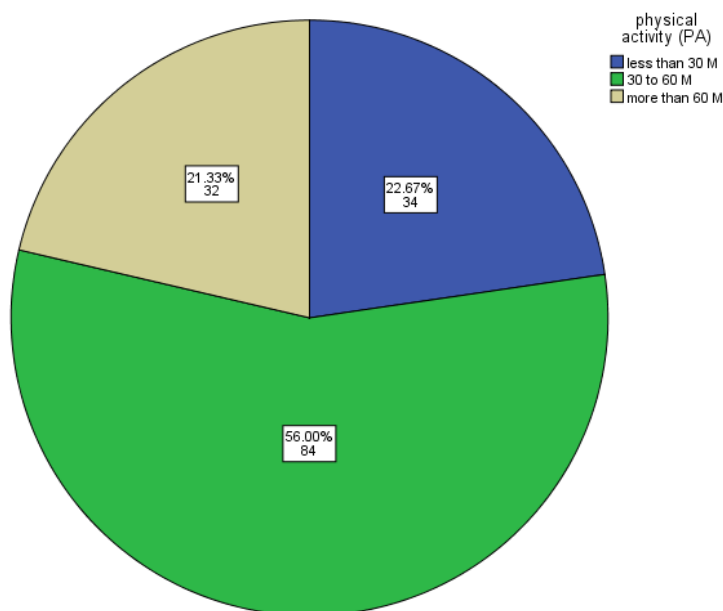
### Results

The data collected on 150 subjects shown that, one third of the subjects were male and around tow third female. More than 50 % of the subjects have age groups between 18-25 years old followed by age groups 26-40 years old (2.6.7%). Furthermore, around 50% of the subjects were single and 24% married. In regard the education levels the highest levels reported was university 41.3% followed by those with secondary levels (28%). Government work as a types of job presented by 40% and private business by 16.7% (Table 1). Around 56% of the subjects were participate in physical activities in 30-60 minutes/day and 21.33% and 22.67% for less than 60 minutes and more than 30 minutes/day respectively (Figure 1).

**Table 1.** Socio-demographic characteristics

		N	N %
Gender	Male	53	35.3%
	Female	97	64.7%
	Total	150	100.0%
Age	lower than 18	13	8.7%

	From 18 to 25	81	54.0%
	From 26 to 40	40	26.7%
	From 41 to 60	15	10.0%
	Above 60	1	0.7%
	Total	150	100.0%
Marital status	Single	72	48.0%
	Married	36	24.0%
	Divorced	17	11.3%
	Widow	25	16.7%
	Total	150	100.0%
Educational level	Illiteracy	29	19.3%
	Primary	17	11.3%
	Secondary	42	28.0%
	University	62	41.3%
	Total	150	100.0%
Occupation	Unemployed	15	10.0%
	House wife	18	12.0%
	Government work	60	40.0%
	Private work	25	16.7%
	Retired	9	6.0%
	Business	23	15.3%
	Total	150	100.0%



**Figure 1.** Physical activities of the patients

The health status of the subjects was investigated and found that as many as 25% suffering from anemia, vitamin D deficiency, depression and dry mouth (Table 2).

**Table 2.** Previous medical history

	N	N %
Anemia	29	19.3%
Vitamin D deficiency	32	21.3%
Depression	26	17.3%
Diarrhea	17	11.3%
Constipation	7	4.7%
Dry mouth	24	16.0%
Acne	8	5.3%
Hair loss	7	4.7%
Total	150	100.0%

The use of weight management products result in significant body weight, BMI and waist circumferences reduction ( $P < 0.05$ ) (Table 3).

**Table 3.** Anthropometric measurement before and after used weight management products

	Before Products use	After Products use	P values
	Mean $\pm$ SEM	Mean $\pm$ SEM	
Body weight	92 $\pm$ 5	85 $\pm$ 2	0.01
height	1.7 $\pm$ 0.2	1.7 $\pm$ 0.6	0.1
BMI	32 $\pm$ 2	29.4 $\pm$ 3	0.03
waist	99 $\pm$ 3	94 $\pm$ 5	0.01
hips	97 $\pm$ 5	91 $\pm$ 8	0.07
WHR	1 $\pm$ 0.2	1 $\pm$ 0.2	1

T test has been used for comparison the mean and considered significant at  $\alpha < 0.05$ .

The health problems and complication has been reported after using the products revealed that, vitamin D deficiency, dry mouth, anemia and acne 20.7%, 14.7%, 13.3%, and 13.3% respectively but none of them statistically significant (Table 4).

**Table 4.** Health problems after used weight management products

	N	N %
Anemia	20	13.3%
Vitamin D deficiency	31	20.7%
Depression	11	7.3%
Diarrhea	15	10.0%
Constipation	9	6.0%
Dry mouth	22	14.7%
Acne	20	13.3%
Hair loss	5	3.3%
Ulcer	10	6.7%
Digestive disorders	7	4.7%
Total	150	100.0%

The next, further analysis the complication and health problems associated with weight management product presented in table 3.5. There was some improved in health status after using the weight management products include anemia, depression. However, there was evidence for developing of ulcer and GIT disorder after using the weight management products (Table 5).

**Table 5.** Comparison of health problems and complication before/after use of the weight management medication

	Complication before use the products		Complication after use the products	
	N	N %	N	N %
Anemia	29	19.30%	20	13.30%
Vitamin D deficiency	32	21.30%	31	20.70%
Depression	26	17.30%	11	7.30%
Diarrhea	17	11.30%	15	10.00%
Constipation	7	4.70%	9	6.00%

Dry mouth	24	16.00%	22	14.70%
Acne	8	5.30%	20	13.30%
Hair loss	7	4.70%	5	3.30%
Ulcer	-	-	10	6.70%
Digestive disorders	-	-	7	4.70%
Total	150	100.00%	150	100.00%

The most common weight management product for weight reduction was fit slim, green tea, green coffee and orlistat, 20%, 18%, 14.7% and 8% respectively (Table 6). Furthermore, most of the participants thought that the weight management products safe (97.3%), not expensive 70%, and the duration for use reported for the first three months was 40.7% (Table 6).

**Table 6.** Types of weight management products

		N	N %
Type of product for lose weight	Metformin	4	2.7%
	Orlistat	12	8.0%
	Super slim pineapple	7	4.7%
	Keto tablets	7	4.7%
	Green tea	27	18.0%
	Green coffee	22	14.7%
	Ginger tea	10	6.7%
	Fit slim	30	20.0%
	Turbo slim	5	3.3%
	Others	18	12.0%
	I do not use	8	5.3%
	Total	150	100.0%
Do you think the product is safe	Yes	146	97.3%
	No	4	2.7%
	Total	150	100.0%
Do you think the product is expensive	Yes	45	30.0%
	No	105	70.0%
	Total	150	100.0%
Product usage duration	less than 1 month	38	25.3%

1-2 month	61	40.7%
3-5 month	21	14.0%
6-9 month	11	7.3%
10 month to 1 year	10	6.7%
More than 1 year	9	6.0%
Total	150	100.0%

In the next, weight management products further investigated and found that about 45% of the participants were used the products twice a day (44.7%), and 35.3% used once a day. Around 74% use the products for weight management before eating. Moreover, the participants used the products based on advice of the dieticians (45.3%) and 92% were reported they were satisfied with the used of the products for weight reduction (Table 7).

**Table 7.** Weight management products parameters

	N	N %
Dosing	Once a day	53 35.3%
	Twice a day	67 44.7%
	3 times a day	19 12.7%
	More than 3 times	11 7.3%
	Total	150 100.0%
Product usage time	Before eating	111 74.0%
	After eating	39 26.0%
	Total	150 100.0%
Who advised you use the product	Doctor	44 29.3%
	Dietitian	68 45.3%
	Friends	18 12.0%
	Media	20 13.3%
	Newspaper	0 0.0%
	Total	150 100.0%
Are you satisfied with the products	Yes	138 92.0%
	No	12 8.0%
	Total	150 100.0%

The most common effect weight management products for body weight, BMI and waist size reduction was green coffee ( $P < 0.05$ ), while the other products mostly significant effect on reduction of weight and/ or BMI or waist (Table 8).

**Table 8.** Relation between types of weight management products and anthropometric measurements

Types of weight management products	Waist after medication used  <b>Mean <math>\pm</math> SD</b> <b>P values</b>	Waist before medication used  <b>Mean <math>\pm</math> SD</b>	BMI After medication used  <b>Mean <math>\pm</math> SD</b> <b>P values</b>	BMI before medication used  <b>Mean <math>\pm</math> SD</b>	body weight after medication used  <b>Mean <math>\pm</math> SD</b> <b>P values</b>	body weight before medication used  <b>Mean <math>\pm</math> SD</b>
metformin	89 $\pm$ 5 (P=0.01)	92 $\pm$ 5	35.12 $\pm$ 12*	32 $\pm$ 2	90 $\pm$ 8 (P=0.001)	98 $\pm$ 3
orlistat	102 $\pm$ 12*	101 $\pm$ 7	31.17 $\pm$ 6*	30.1 $\pm$ 5	94 $\pm$ 8 (P=0.03)	101 $\pm$ 17
super slim pineapple	101 $\pm$ 23*	99.01 $\pm$ 9	28.41 $\pm$ 6 (P=0.01)	32 $\pm$ 2	86 $\pm$ 7 (P=0.001)	96 $\pm$ 7
keto tablets	94 $\pm$ 5*	95 $\pm$ 9	31.92 $\pm$ 3*	32 $\pm$ 7	91 $\pm$ 9 (P=0.002)	99 $\pm$ 13
green tea	96 $\pm$ 8*	93 $\pm$ 19	29.19 $\pm$ 4*	32 $\pm$ 12	82 $\pm$ 10 (P=0.000)	97 $\pm$ 3
green coffee	88 $\pm$ 8 (0.003)	92 $\pm$ 5	29.08 $\pm$ 5 (P=0.04)	32 $\pm$ 2	86 $\pm$ 8.9 (P=0.001)	100 $\pm$ 8
ginger tea	95 $\pm$ 7*	94.9 $\pm$ 10	31.23 $\pm$ 2*	30.1 $\pm$ 3	86 $\pm$ 11 (P=0.01)	99 $\pm$ 3
fit slim	97 $\pm$ 9*	95 $\pm$ 12	28.51 $\pm$ 7 (P=0.02)	32 $\pm$ 2	84 $\pm$ 5 (P=0.000)	95 $\pm$ 7
turbo slim	97 $\pm$ 6*	95 $\pm$ 23	31.66 $\pm$ 4*	32.1 $\pm$ 4	90 $\pm$ 11(P=0.006)	98 $\pm$ 9
others	98 $\pm$ 11*	96 $\pm$ 25	28.84 $\pm$ 5 (P=0.01)	32 $\pm$ 2	84 $\pm$ 7 (P=0.000)	99 $\pm$ 13

T Test has been used for the comparison which considered significant at  $\alpha < 0.05$ : \* Non-significant values ( $\alpha > 0.05$ )

The most action of ingredients used in weight management indirectly may effect on weight loss through increase release of energy, laxative, diuretics, antioxidants, and some of the ingredient do not know their function while the other have other function not related to weight loss such as regulate blood pressure, heart function, sleeping, anti-depression etc. (Table 9).

**Table 9.** Constituent action and their purposes of uses

Constituent and action	Purposes
Disodium hydrogenphosphate dihydrate: added to food and cosmetics and other preservatives, flavor enhancer.	Food additives
Propylene glycol: help preservative moisture dissolve color, flavor, anti-freezer.	Antifreeze
Gymnema sylvestre: reduces sugar craving by making sweet food less appealing, helps lower blood sugar.	Food additive
Titanium dioxide: used as a white pigment in tablets, making pharmaceuticals safer to use and easier to manage.	Excipients
Fructooligosaccharides: protect against unhealthy bacteria help the bacteria good to grow, and use FOS for constipation, obesity, DM, travelers' diarrhea, and high cholesterol, may decrease cholesterol levels.	Reduced weight
Gelatin: helps reduce appetite, increase the feeling of fullness, help promote weight loss, and manage blood sugar.	Appetite suppress
Fibers: make you feel full, helps slow down digestion, and help you better manage your insulin.	Satiety
Chromium: plays an essential role in glucose role.	Glucose metabolism
Hawthorn: used to help protect against heart disease, and help control high blood pressure and high cholesterol.	Regulate heart
Cassia seeds: means they can be helpful to aid with sleep and sometimes used to aid with constipation.	Laxative
Lotus: contains chemicals that decrease swelling, kill cancer cells and bacteria, reduce blood sugar, help the breakdown of fat, and protect the heart, and blood vessels.	Antioxidants
Chromium picolinate is a form of the mineral chromium that can be found in supplements many of these products claim to improve nutrient metabolism and produce weight loss.	Food supplements
Banaba: lower blood glucose in people with type 2 diabetes.	Treated DM
Phenylalanine: most commonly used for skin disorders, obesity.	Amino acid

Green coffee: used removed caffeine from coffee also been used weight loss supplement.	Weight loss
Gymnema: contributes to fighting obesity, losing excess weight, reducing a person's appetite and desire to eat sweet and sugary food.	Weight loss
Centella harp: used to treat attention deficit disorders, vitiligo, high cholesterol, digestive disorders, urinary tract.	antiaging
Acetyl carnitine: effective in protecting the brain from neurological diseases as well for healthy body, energy production.	Aid energy production
Bitter orange: have been marketed like weight loos, appetite suppressant.	Weight loss
Green tea: count catechin called (EGCG) natural antioxidants that help prevent cell damage.	Antioxidants
Stevia leaves: can be processed into liquid or powdered stevia which is much sweeter than sugar the extract is virtually calorie CHO free, contains only trace amount of minerals.	Sweetener
Garcinia hydroxycitric acid: is used an appetite suppressant, weight loss supplement, its active ingredient reduces synthesis fatty acid, glycogen storage via inhibition of ATP citratelase.	appetite suppressant
Attarctylodis: improve the function of digestive tract, reduce pain and swelling (inflammation) some chemicals may prevent cancer cells form growing.	Diuretics
Rhizomes: In the treatment , control prevention cancer, liver ulcer, oxidation, inflammation, obesity.	turmeric
Match tea: high in antioxidant, help protect liver, may prevent cancer, heart healthy and lose weight.	Antioxidants
Abslim: converts the accumulated fat in body into energy, reduces cholesterol, burn fat and reduce appetite, it is asexual tonic for both sexes b/c contains ginseng.	Aid in energy release
Fucus: used treatment of iodine deficiency.	-----
Carcinia: reduce the effect of one of the body enzymes, increase secretion of serotonin in the body, reduces weight and appetite.	Weight loss supplements
Cuar: help reduce cholesterol and glucose, working to increase absorb fluid of case of diarrhea, increase soften stool in constipation.	Unknown
Glucomannan: reduce absorption of protein, fat, reduce calories.	Dietary fiber
Cinnmon: help lower, maintain blood sugar, help sensitivity to action of the hormone, aid blocking the activity many digestive enzyme, the slowing the absorption of sugar form blood after eating high CHO meal.	Spices
Microcrystallin cellulose: optimizes absorption of nutrients in supplement, help eliminate toxic compounds, thereby promoting weight loss, improve digestion fiber thus preventing	Laxative

constipation and retention of stool in GIT	
Chitosan: reduce weight, cut appetite, prevent absorption of fat, clean the digestive system form accumulated toxins, chronic constipation.	hemostatic agents
Carnitine: burns fat, enhanced recovery form ANL carnitine injection, improve cholesterol, and Triglycerides, help WT lose.	
Vitamin C: depleted individual may be more resistance to fat mass loss.	Antioxidants
Dieceren: significant in total insulin secretion without change in insulin sensitivity.	Enhance insulin secretion
linolic acid: shown that CLA reduces body fat by increasing of amount of specific enzymes and proteins involved in fat breakdown.	Fatty acid oxidation
Spirulina senna.	Laxative
Calcium proprietary.	Dietary supplement
Calcium BHB sodium BHB.	Keton bodies
Orlistat.	Inhibit fat absorption
Garcinia cambogia.	Antioxidants
Coffee bean.	Antioxidants
Wheat bran cyloly fiber.	Dietary fiber

## Discussions

This study describes the evaluation of a patient-centered model to control overweight, obesity and other concomitant health problems in Benghazi community pharmacy. In this study, patients achieved a significant reduction in weight and waist circumference after three months of using the weight managements products. The pharmaceutical intervention detected 308 negative clinical results associated with medication and the number of patients with mood and digestive minor ailments significantly decreased during the follow-up period [19]. According to previous evidence, a reduction of 5% from initial weight in people with overweight and obesity is sufficient to gain some health benefits [20]. In the present study, nearly 20% of the patients achieved this weight reduction at three-months. This proportion was similar to other weight management programs in the community pharmacy [19].

Some health improved has been notices in this study after using weight reduction medications include anemia, depression. This finding were similar to other studies [21, 22] by which such improvements where due to body

weight. However, there was evidence for developing of ulcer and GIT disorder after using the weight management products and this probably present some ingredients irritated GIT such as high dietary fiber.

This study highlighted some finding include the patients used some products were not approved by FDA, the only one product found approved by FDA was Orlistat [23]. The orlistat achieved significant weight reduction and this was agreeing with number of studies [24, 25] while the other products such as green tea, fit slim and green coffee were need to be further investigated in the literature because according to our knowledge no studies investigate the efficiency of such products.

The most action of ingredients used in weight management indirectly may effect on weight loss through increase release of energy, laxative, diuretics, antioxidants, and some of the ingredient do not know their function while the other have other function not related to weight loss such as regulate blood pressure, heart function, sleeping, anti-depression etc. These products so called off labeling due to unproved products [26]. Furthermore, It is also important to realize that some diet pills contain ingredients not listed on their labels which are also not approved by the FDA. A 2018 study looked at 317 different weight loss products and found that 269 of them (84.9%) contained sibutramine—an ingredient that the FDA removed in 2010—as a hidden ingredient [27]. Though this substance helps reduce appetite short term, it has also been connected with mood changes, increased blood pressure and heart rate, and even amnesia.

Some ingredients such as Linoleic Acid, a 2016 review of seven studies concluded that CLA might promote weight loss, but the difference in taking this substance versus taking a placebo is relatively small [28]. Another 2016 study found that some people who took a CLA supplement experienced increased insulin resistance and lower HDL cholesterol levels [29]. For the chromium, while some research has shown a small correlation between chromium and weight loss, there is insufficient evidence to support a more substantial claim [30]. Green tea, s safe when consumed in moderation, little evidence supports its use as a long-term weight loss supplement [33]. A study of 64 women with obesity found that while they all lost weight on a low-calorie diet, those who received 400 mg of green coffee bean extract for eight weeks lost more weight than those who did not take the extract. They also had lower total cholesterol and LDL, or "bad" cholesterol levels [31, 32].

## Conclusions

The present study revealed that, use of weight management products result in significant weight, BMI and waist circumferences reduction. Furthermore, the health problems and complication revealed that, vitamin D deficiency, dry mouth, anemia and acne but these health problems improved after using the products. The most common weight management product for weight reduction was fit slim, green tea, green coffee and orlistat, 20%, 18%, 14.7% and 8% respectively. There was evidence for developing of ulcer and GIT disorder after using the weight management products. The most common effect weight management products for body weight, BMI and waist size reduction was green coffee, while the other products mostly significant effect on reduction of body weight and/ or BMI or waist. Moreover, the most action of ingredients used in weight management indirectly may effect on weight loss through increase release of energy, laxative, diuretics, antioxidants, and some of the ingredient do not know their function while the other have other function not related to weight loss such as regulate blood pressure, heart

function, sleeping, anti-depression. Overall, most of the products available in the pharmacies were not approved by FDA.

### **Declarations**

#### **Source of Funding**

This research did not receive any specific grant from funding agencies in the public, or not-for-profit sectors.

#### **Competing Interests**

The authors declare no competing financial, professional and personal interests.

#### **Consent for publication**

The authors declare that they consented for the publication of this study.

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